



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
PREVENTION, PESTICIDES  
AND  
TOXIC SUBSTANCES

PC Code: 103201 / 090301

DP Barcode: D301170  
D301582

DATE: April 27, 2004

**MEMORANDUM**

**SUBJECT:** EFED Evaluation of Avian Risk from Scatter-baits Containing Tricosene and Methomyl

**TO:** Thomas Harris, Chemical Review Manager  
Registration Division

**FROM:** Todd A. Phillips, Ph.D., Biologist  
Thomas M. Steeger, Ph.D., Senior Biologist  
Environmental Risk Branch IV  
Environmental Fate and Effects Division (7507c)

*Todd A. Phillips 4/27/04*  
*Thomas M. Steeger, 4/27/04*

**APPROVED**

**BY:** Elizabeth Behl, Branch Chief  
Environmental Risk Branch IV  
Environmental Fate and Effects Division

*Elizabeth Behl 4/28/04*

The Environmental Fate and Effects Division (EFED) has completed a screening-level evaluation of the risk to birds from scatter-baits co-formulated with tricosene (PC Code 103201) and methomyl (PC Code 090301) to control flies in animal stock yards. Chronic risk quotient (RQ) values ranged from 21 to 222 for scatter-baits containing 0.025% to 0.26% tricosene, respectively (see attachment DP Barcode D301170). These results indicate that at tricosene concentrations typically used in scatter-baits, chronic risk levels of concern ( $RQ \geq 1.0$ ) are exceeded for birds and that tricosene concentrations are high enough to pose a risk of reproductive effects in birds following chronic exposure.

During the course of this evaluation, the acute risk to birds exposed to scatter-baits containing methomyl was also examined. Acute RQ values were 6.0 and 6.6 for scatter-baits containing 1.00% and 1.100%, respectively (see attachment DP Barcode D301582). These results indicate that at methomyl concentrations typically used in scatter-baits, acute risk levels of concern ( $RQ \geq 0.1$ ) are exceeded and that methomyl concentrations are high enough to pose a risk of mortality in birds following acute exposure.

Thus, in determining whether tricosene concentrations in scatter-baits are likely to result in chronic effects in birds, EFED has concluded that birds are more likely to die from acute exposure to methomyl before reproductive effects, caused by chronic exposure to tricosene, would occur.



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PC Code: 103201  
DP Barcode: D301170  
DATE: April 20, 2004

**MEMORANDUM**

**SUBJECT:** Chronic Risk to Birds Exposed to Scatter-baits Containing Tricosene

**TO:** Thomas Harris, Chemical Review Manager  
Registration Division

**FROM:** Todd A. Phillips, Ph.D., Biologist  
Thomas M. Steeger, Ph.D., Senior Biologist  
Environmental Risk Branch IV  
Environmental Fate and Effects Division (7507c)

**APPROVED**

**BY:** Elizabeth Behl, Branch Chief  
Environmental Risk Branch IV  
Environmental Fate and Effects Division

Chronic risk quotient (RQ) values were calculated to assess the risk to small birds (20 g) exposed to tricosene in fly baits (used as scatter-baits) at concentrations up to 0.26%. Estimated chronic RQ values were 222, 41.7, 33.3, and 21.3 for scatter-baits containing 0.26%, 0.049%, 0.040%, and 0.025% tricosene, respectively, and exceed chronic risk levels of concern (LOC) for birds. Therefore, at currently labeled use rates, tricosene may pose a risk of reproductive effects in birds following chronic exposure. Tricosene content in scatter-baits would have to be less than 0.001% in order to not exceed chronic risk LOC's.

Exposure was calculated based on the daily food intake as estimated by Nagy (1987), a 20 g bird will consume about 5.1 g of food day<sup>-1</sup>. This results in a maximum dose to small birds of 13.3 mg a.i. tricosene day<sup>-1</sup> from scatter-baits containing 0.26% tricosene (5.1 g day<sup>-1</sup> \* 1000 mg g<sup>-1</sup> \* 0.0026). Calculated maximum doses to small birds ingesting scatter-baits containing 0.049%, 0.040%, and 0.025% tricosene, are 2.5, 2.0, and 1.3 mg a.i. day<sup>-1</sup>, respectively.

Risk quotients were determined using the following formula:

$$RQ = \frac{\text{Daily food intake}^1}{\text{Adj. NOEC}}$$

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<sup>1</sup>mg tricosene day<sup>-1</sup>

The no observed effect concentration (NOEC) was adjusted (adj.) for body weight based on a modification to the formula (NOEC is substituted for LD50) recommended by Mineau *et al.* (1996):

$$\text{Adj. NOEC} = \text{NOEC} \left( \frac{AW}{TW} \right)^{(a-1)}$$

where “adj. NOEC” is the NOEC of the species being assessed, “NOEC” is the no observed effect concentration of the test organism, “AW” is the body weight for the assessed organism, “TW” is the body weight of the test organism, and “a” is the slope of the regression line for estimating the assessed species’ NOEC from the test species NOEC (EFED default value of 1.15 was used). In this case, 20 g was the assumed weight of the assessed organism (small bird) and 1000 g was the assumed weight of the test organism (mallard duck, *Anas platyrhynchos*). The NOEC for the mallard duck was 0.1 mg kg<sup>-1</sup> (MRID 007019) and the adjusted NOEC was 0.06 mg kg<sup>-1</sup>. The RQ values using this method were 222, 41.7, 33.3, and 21.3 for scatter-baits containing 0.26%, 0.049%, 0.040%, and 0.025% tricosene, respectively. Levels of concern (LOC) for chronic risk to birds are exceeded; therefore, tricosene does pose a chronic risk to birds when used in accordance with the label guidelines. To mitigate this risk, the concentration of tricosene in scatter-baits may not exceed 0.001% based on the NOEC of 0.1 mg kg<sup>-1</sup>.

The NOEC was determined by evaluating five avian reproduction studies (3 mallard duck and 2 Northern bobwhite quail, *Colinus virginianus*) conducted from 1973 to 1975. The NOEC of 0.1 mg kg<sup>-1</sup> was determined from a mallard duck reproduction study (MRID 007019) that found no effects at two concentrations of tricosene (0.1 mg kg<sup>-1</sup> 94.7% tricosene and 0.1 mg kg<sup>-1</sup> 63.1% tricosene). Conflicting results were observed in two additional mallard duck reproduction studies. In the first study (MRID 007038), 2 mg kg<sup>-1</sup> tricosene reduced 14-day-old survival; however, no effects were observed at 2 mg kg<sup>-1</sup> tricosene in the second study (MRID 0083020). Also, no effects were observed at 20 mg kg<sup>-1</sup> tricosene in two Northern bobwhite quail reproduction studies (MRID 0084455 and 0070473).

Therefore, EFED is uncertain how closely the NOEC may lie to the LOEC for mallard ducks, which could have a substantial impact on the concentration of tricosene that may be used in scatter-baits without exceeding the LOC for chronic exposure to birds. For example, based on an NOEC of 2.0 mg kg<sup>-1</sup>, tricosene may be used at a concentration of 0.022% without exceeding the LOC for chronic exposure to birds, which is very close to the lowest concentration currently used (0.025%). Additionally, EFED is uncertain how the appearance of the formulated product (granules vs. flakes) may impact the willingness of birds to consume the product. It has been suggested that flakes are much less likely to be consumed than granules; however, while the methomyl RED alludes to this, no evidence is provided to substantiate this claim.



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PC Code: 090301  
DP Barcode: D301170  
DATE: April 21, 2004

**MEMORANDUM**

**SUBJECT:** Acute and Chronic Risk to Birds Exposed to Scatter-baits Containing Methomyl

**TO:** Thomas Harris, Chemical Review Manager  
Registration Division

**FROM:** Todd A. Phillips, Ph.D., Biologist  
Thomas M. Steeger, Ph.D., Senior Biologist  
Environmental Risk Branch IV  
Environmental Fate and Effects Division (7507c)

**APPROVED**

**BY:** Elizabeth Behl, Branch Chief  
Environmental Risk Branch IV  
Environmental Fate and Effects Division

Acute and chronic risk quotient (RQ) values were calculated to assess the risk to small birds (20 g) exposed to methomyl in fly baits (used as scatter-baits) at concentrations up to 1.100%. The acute RQ values were 5.96 and 6.55 for scatter-baits containing 1.00% and 1.100% methomyl, respectively, and exceed acute risk levels of concern (LOC) for birds. The chronic RQ values were 0.61 and 0.67 for scatter-baits containing 1.00% and 1.100% methomyl, respectively, and do not exceed the chronic risk LOC for birds. Therefore, at currently labeled use rates, methomyl does pose an acute risk to endangered and nonendangered birds, but does not pose a chronic risk.

Exposure was calculated based on the daily food intake as estimated by Nagy (1987), a 20 g bird will consume about 5.1 g of food day<sup>-1</sup>. This results in a maximum dose to small birds of 56.1 mg a.i. methomyl day<sup>-1</sup> from scatter-baits containing 1.100% methomyl (5.1 g day<sup>-1</sup> \* 1000 mg g<sup>-1</sup> \* 0.011).

Risk quotients were determined using the following formula:

$$RQ = \frac{\text{Daily food intake}^2}{\text{Adj. LD50}}$$

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<sup>2</sup>mg methomyl day<sup>-1</sup>

The LD50 was adjusted (adj.) for body weight based on the formula recommended by Mineau *et al.* (1996):

$$\text{Adj. LD50} = \text{LD50} \left( \frac{\text{AW}}{\text{TW}} \right)^{(a-1)}$$

where “*adj. LD50*” is the LD50 of the species being assessed, “*LD50*” is the LD50 of the test organism, “*AW*” is the body weight for the assessed organism, “*TW*” is the body weight of the test organism, and “*a*” is the slope of the regression line for estimating the assessed species’ LD50 from the test species LD50 (EFED default value of 1.15 was used). In this case, 20 g was the assumed weight of the assessed organism (small bird) and 1000 g was the assumed weight of the test organism (ring-necked pheasant, *Phasianus colchicus*). The LD50 for the ring-necked pheasant was 15.4 mg kg<sup>-1</sup> (MRID 00160000) and the adjusted LD50 was 8.56 mg kg<sup>-1</sup>. The RQ values using this method were 5.96 and 6.55 for scatter-baits containing 1.00% and 1.100% methomyl, respectively. Levels of concern (LOC) for acute risk are exceeded for endangered and nonendangered birds; therefore, methomyl does pose an acute risk to birds when used in accordance with the label guidelines.

Chronic RQ values were calculated using the previously described formula, except the “*adj. NOEC*” was substituted for the “*adj. LD50*”. In addition, the “*adj. NOEC*” was calculated using a modification (NOEC was substituted for LD50) to the formula recommended by Mineau *et al.* (1996):

$$\text{Adj. NOEC} = \text{NOEC} \left( \frac{\text{AW}}{\text{TW}} \right)^{(a-1)}$$

The mallard duck (*Anas platyrhynchos*) NOEC of 150 mg kg<sup>-1</sup> (MRID 41898601) and assumed weight of 1000 g were used to calculate the “*adj. NOEC*” of 83.4 mg kg<sup>-1</sup>. The chronic RQ values were 0.61 and 0.67 for scatter-baits containing 1.00% and 1.100% methomyl, respectively, and do not exceed the chronic risk LOC for birds. Therefore, at currently labeled use rates, methomyl does not pose a chronic risk to birds.